CLAIMS:

1. A method for extracting information from an observed signal representing measured brain activity of a subject in order to evaluate the state of the CNS of said subject, said method comprising:

a) acquiring a plurality of reference signals, each said reference signal corresponding to a distinct CNS state obtained from a reference subject or subjects;

b) selecting a transformation function which, when applied to one of said reference signals or said observed signal, yields a set of coefficients;

c) selecting a statistical function which, when applied to said set of coefficients derived from one of said reference signals, or a subset of said set of coefficients, yields a reference data set which characterizes the distinct CNS state corresponding to said set of coefficients;

d) applying said transformation and statistical function to said plurality of reference signals to produce a plurality of reference data sets which distinguish between the distinct CNS states corresponding to said reference signals;

e) observing the brain activity of said subject to produce said observed signal;

f) applying said transformation and statistical function to said observed signal to produce an observed data set;

g) comparing the observed data set to one or more of said reference data sets; and

h) computing a numerical value or values representative of said state of the CNS of said subject which results from said comparison.

2. The method of claim 1 wherein said observed and reference signals representing measured brain activity of a subject are electroencephalograms.

3. The method of claim 1 wherein said observed signal representing measured brain activity of a subject comprises a plurality of electroencephalograms.

4. The method of claim 1 wherein said reference subject or subjects are not the same individual as said subject.

5. The method of claim 1 wherein said statistical function is selected from the group histogram, probability density function, standard deviation, or variance.

6. The method of claim 1 wherein said statistical function is a probability density function.

7. The method of claim 1 used to measure neurological activity in said subject to ascertain the level of consciousness of said subject.

8. The method of claim 1 used to measure neurological activity in said subject to ascertain the level of hypnosis of said subject.

9. The method of claim 1 used to measure neurological activity in said subject to ascertain the effects of anesthetic agents on the brain of said subject.

10. The method of claim 1 used to measure neurological activity in said subject to ascertain the effects of psychoactive medicaments on the brain of said subject.

11. The method of claim 1 used to measure neurological activity in said subject to obtain the pharmacodynamic and pharmacokinetic models of neurologic and psychoactive compounds and medicaments.

12. The method of claim 1 used to measure neurological activity in said subject to ascertain titration and dosage profiles of neurologic and psychoactive compounds and medicaments.

13. The method of claim 1 used to measure neurological activity in said subject to detect and ascertain the level of brain ischemia.

14. The method of claim 1 used to measure neurological activity in said subject to ascertain the effects of neurologic and psychoactive compounds and medicaments on the brain of said subject.

15. The method of claim 1 wherein said distinct CNS states represent any distinct states taken from the continuum from conscious to no brain activity.

16. The method of claim 15 wherein said distinct CNS states are selected from sedation, light anesthesia, deep anesthesia and no brain activity.

17. The method of claim 1 wherein said distinct states are two extreme states.

18. The method of claim 17 wherein said extreme states are fully conscious and no brain activity.

19. The method of claim 1 wherein said transformation function is a wavelet transform.

20. The method of claim 6 wherein said transformation function is a wavelet transform.

21. The method of claim 1 wherein said transformation function is a wavelet packets transform.

22. The method of claim 1 wherein said transformation function is a transform with both time and frequency localization properties.

23. The method of claim 1 wherein said transformation function is a filter with appropriate frequency response which yields said sets of coefficients representing the content of the brain activity in a specific frequency band.

24. The method of claim 25 wherein said filter is a wavelet filter.

25. The method of claim 25 wherein at least one said specific frequency band is chosen such that the statistical representation of said subset of coefficients differentiates between distinct CNS states.

26. The method of claim 1 wherein said comparison is done by computing the correlation between the observed data set and the reference data sets.

27. The method of claim 1 wherein said comparison is done by means of a distance metrics.

28. The method of claim 1 wherein the result of said comparison is a number of values.

29. The method of claim 30 wherein said number of values are combined into at least one value indicative of the state of CNS.

30. The method of claim 1 wherein a single-channel electroencephalogram is used to provide the observed and reference signals.

31. The method of claim 1 wherein multiple-channel electroencephalogram is used to provide the observed and reference signals.

32. A system for extracting information from an observed signal representing measured brain activity of a subject in order to evaluate the state of the CNS of said subject, given a plurality of reference signals, each said reference signal corresponding to a distinct CNS state obtained from a reference subject or subjects, given a transformation function which, when applied to said observed signal and each of said reference signals, or portions thereof, yields a set of coefficients, and given a statistical function which, when applied to the said set of coefficients derived from each said reference signal, or portions thereof, yields a number of reference data sets which characterize each said distinct reference signal and discriminates between said reference signals, said system comprising:

a. sensor for observing the electrical brain activity of said subject to produce an observed signal; and

b. digital signal processor for

i) applying said transformation function to at least one of said reference signals, or portions thereof, to yield at least one set of coefficients;

ii) applying said statistical function to said set of coefficients derived from each said reference signal, or portions thereof, to yield at least one reference data set;

iii) applying said transformation function and said statistical function to said observed signal to produce an observed data set;

iv) comparing the observed data set to one or more of said reference data sets; and

v) computing a numerical value or values representative of said state of the CNS of said subject which results from said comparison.

33. A computer program product for extracting information from an observed signal representing measured brain activity of a subject in order to evaluate the state of the CNS of said subject, given a plurality of reference signals, each said reference signal corresponding to a distinct CNS state obtained from a reference subject or subjects, given a transformation function which, when applied to said observed signal and each of said reference signals, or portions thereof, yields a set of coefficients, and given a statistical function which, when applied to said set of coefficients derived from each said reference signal, or portions thereof, yields a number of reference data sets which characterize each said distinct reference signal and discriminates between said reference signals, said computer program product comprising a computer usable medium having computer readable program code embodied in said medium for:

a. applying said transformation function to at least one of said reference signals, or portion thereof, to yield at least one set of coefficients:

b. applying said statistical function to said at least one set of coefficients derived from said at least one reference signal, or portion thereof, to yield at least one reference data set;

c. applying said transformation function and said statistical function to said observed signal to produce an observed data set;

d. comparing the observed data set to said at least one reference data set; and

e. computing a numerical value or values representative of said state of the CNS of said subject which results from said comparison.

36. A computer system comprising the computer program of claim 35 and data processor.